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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,571	07/11/2001	Oliver Klein	4009-2	4817

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EXAMINER	
BARNIE, REXFORD N	

ART UNIT	PAPER NUMBER
2643	

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/901,571	KLEIN ET AL.	
	Examiner	Art Unit	
	REXFORD N. BARNIE	2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02/25/2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

RexfordBarnie

REXFORD BARNIE
PRIMARY EXAMINER

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 9, 10, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/57819 (Popovic et al.) in view of Sengupta et al. (US Pat# 6,288,674) or Kyeong et al. (US 2002/0054621).

Regarding claim 1, WO '819 teaches a search window delay by tracking in code division multiple access communication system in (see abstract, claims, page 4, figs. (fig. 4)) comprising:

estimating a channel impulse response for a received signal containing a plural paths, each path having a corresponding path delay;

calculating a mean delay for the estimated channel impulse response using plural path delays;

determining a delay error between the mean CIR delay and a desired delay position and determining an adjustment to reduce the delay error taking into account, the received signal wherein the error can be adjusted using either linear or non-linear filtering.

WO teaches all the claimed limitations with the exception that an adjustment can be done to correct a signal taking into an account the Doppler frequency or effect to counter multi-path fading.

Sengupta teaches a communication system including a base station which improves signal interference suppression in a multi-path fading environment in (see col. 2 lines 32-44, col. 3 lines 55-60) by using a system which includes a search, fingers, delay element, Doppler profile generator and rake receiver in (see fig. 5). According to (see col. 5 lines 18-29, col. 6 lines 19-33), taking into account, Doppler effect(s) can be used to improve signal quality and can be used to combat fading.

Kyeong et al. teaches an apparatus for very high performance spaced array reception processing comprising of a plurality of antenna, a weighjt vbector estimator, a demodulation unit, correlation selector, a delay element and a Doppler frequency estimator in (see figs. 5-6, section 0012, 0013, 0016, 0035, 0044, 0052, 0053) wherein Doppler frequency effect can be used inorder to compensate for distortion created by fading (see section 0001).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of either one of the secondary references into that of Popovic (WO "819) thus making it possible to take into account Doppler effect and combating signal distortion to improve signal quality or intelligibility.

Regarding claim 2, The combination including WO (Popovic) teaches a CIR search windown defines a delay profile that contains the plural paths of the received signal in (see elements 130-136 of fig. 12 and fig. 3).

Regarding claim 9, The combination teaches selecting optimal ones of the plural paths based on estimated channel impulse response, demodulating each apth with its delays and combining the demodulated paths in (see figs. (fig. 4), page 12 line 24-page 13 line 2 of WO (Popovic)).

Regarding claim 10, The combination teaches the claimed limitation in (see page 18 of WO (Popovic).

Regarding claim 11, The combination including Popovic et al. in (see pages 17-23).

Regarding claim 13, The combination including Kyeong or Sengupta.

Regarding claim 14, WO teaches a radio receiver in (see fig. 1 and fig. 4, page 3-5) receiving from each of plural cells a signal transmitted from a transmitter containing plural paths, each path having a path delay comprising the steps of:

for each cell, estimating a channel impulse response for the received signal using a channel estimator;

defining an associated search window for each channel estimator, where each search window defines a delay profile containing plural paths of the received signal;

selecting optimal ones of the plural paths from the delay profiles;

calculating a delay error between the calculated mean delay and a desired delay and calculating an adjustment signal to reduce the delay error. WO teaches all the claimed limitations with the exception that an adjustment can be done to correct a signal taking into an account the Doppler frequency or effect to counter multi-path fading.

WO fails to teach calculating or estimating a Doppler effect frequency which can be taken into consideration how to process signals to reduce errors or interference.

Sengupta teaches a communication system including a base station which improves signal interference suppression in a multi-path fading environment in (see col. 2 lines 32-44, col. 3 lines 55-60) by using a system which includes a search, fingers, delay element, Doppler profile generator and rake receiver in (see fig. 5). According to (see col. 5 lines 18-29, col. 6 lines 19-33), taking into account, Doppler effect(s) can be used to improve signal quality and can be used to combat fading.

Kyeong et al. teaches an apparatus for very high performance spaced array reception processing comprising of a plurality of antenna, a weighjt vbector estimator, a demodulation unit, correlation selector, a delay element and a Doppler frequency estimator in (see figs. 5-6, section 0012, 0013, 0016, 0035, 0044, 0052, 0053) wherein Doppler frequency effect can be used inorder to compensate for distortion created by fading (see section 0001).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of either one of the secondary references into that of Popovic (WO "819) thus making it possible to take into account Doppler effect and combating signal distortion to improve signal quality or intelligibility.

Claims 3-4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/57819 (Popovic et al.) in view of Sengupta et al. (US Pat# 6,288,674) or Kyeong et al. (US 2002/0054621) and further in view of Teder et al. (US Pat# 5,544,156).

Regarding claims 3-4, The combination teaches being able to take into account Doppler effects in combating fading and signal interference but fails to teach using a doppler frequency to determine shifting of a search window.

Teder et al. teaches a communication system in (see figs., col. 3 line 65-col. 7 line 37) with a rate adaptation unit wherein Doppler frequency can be used in determining the window length or sliding estimation window to improve higher link quality and reducing interference.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Teder into that of the combination thus making it possible to reduce interference and enhance signal quality.

Regarding claim 4, The combination including Teder teaches searching and identifying strongest signals and determining a maximum Doppler frequency in (see col. 6 line 34-47 and col. 4 lines 60-col. 4 of Teder et al.).

Regarding claim 12, The combination teaches estimating Doppler based on an approximation in (see col. 5 of Teder and figs. of Kyeong or Sengupta). It's well known to use estimated or already predetermined measured effect in communication networks to control and enhance network systems. The combination including Teder teaches

using fixed parameters and in light of Kyeong or Sengupta, measured parameters as received.

Claims 5-8 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/57819 (Popovic et al.) in view of Sengupta et al. (US Pat# 6,288,674) or Kyeong et al. (US 2002/0054621) and further in view of Ellis et al. (US Pat# 3,394,313).

Regarding claims 5-8 and 19-22, The combination teaches being able to enhance signal in part based on factors including a doppler effect frequency but fails to teach that a doppler means which uses a minimum dwell time.

Ellis teaches a communication system which incorporates a Doppler frequency means which can use a shifting rate expressed as a minimum dwell time in (see col. 2 lines 34-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the invention was to incorporate the teaching of Ellis into that of the combination thus making it possible to use any conventional known method of detecting or implementing Doppler effect in order to enhance signal quality or reduce interference.

Claims 14-18, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/57819 (Popovic et al.) in view of Teder et al. (US Pat# 5,544,156).

Regarding claim 14, WO teaches a radio receiver in (see fig. 1 and fig. 4, page 3-5) receiving from each of plural cells a signal transmitted from a transmitter containing plural paths, each path having a path delay comprising the steps of:

for each cell, estimating a channel impulse response for the received signal using a channel estimator;

defining an associated search window for each channel estimator, where each search window defines a delay profile containing plural paths of the received signal;

selecting optimal ones of the plural paths from the delay profiles;

calculating a delay error between the calculated mean delay and a desired delay and calculating an adjustment signal to reduce the delay error.

WO fails to teach calculating or estimating a Doppler effect frequency which can be taken into consideration how to process signals to reduce errors or interference.

Teder et al. teaches a CDMA communication system in `(see figs.) comprising of using channel estimation, delay estimation, searching to identity strongest signals, demodulators and using a search window in (see cols. 4-7) wherein a doppler frequency can be determined and taken into account when processing incoming signals to improve performance of a receiver.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Teder et al. into that of

Popovic thus making it possible to improve the performance of a receiver by taking into a search window in conjunction with a Doppler frequency.

Regarding claims 15, 17 and 18, the combination including Teder teaches determining a maximum Doppler frequency, sliding window estimation and so forth (see disclosure).

Regarding claim 16, see explanation as set forth regarding claim 12

Regarding claims 23 and 24, The combination in light of Popovic et al. (WO) teaches the claimed limitation in (see figs. and disclosure).

Claims 25-30, 36-44 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO (Popovic) in view of Teder et al. (US Pat# 5,544,156) or Sengupta et al. (US Pat# 6,288,674)

Regarding claim 25, WO (Popovic) teaches a search window tracking unit for use in a radio receiver comprising a processor configured to receive delay and magnitude values associated with selected paths of the received signal and determine a position of a channel impulse response (CIR) corresponding to the selected paths in (see figs. including fig. 6, pages 3-5) and a controller configured to determine a position of a search window used to locate the channel impulse response.

WO fails to teach a search window system which uses a Doppler effect in determining or estimating a search window.

Teder teaches a search window system in (see figs. and col. 4 line 20-col. 7 line 37) wherein a Doppler frequency can be a factor in determining the length of a search

window or position of a search window in part by determining parameters such as delay, channel impulse response, strongest signal, channel estimation, demodulation and so forth to improve performance of the receiver.

Sengupta teaches a wireless communication system utilizing Doppler diversity in (see fig. 5, fig. 10, col. 2 lines 3-9, 32-44, col. 3 lines 55-60, col. 5 lines 18-29 and col. 6) comprising of using channel estimation, demodulation, a searcher and Doppler effect in combating fast fading and enhance performance of the system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of either Teder or Sengupta into that of WO thus making it possible to improve performance of the system and combat fading resulting in better signals.

Regarding claims 26-27, The combination teaches being able to use a profile and estimating. Using current and predetermined parameters in processing signals is notoriously known in the art. (see figs. of Sengupta and disclosure of teder, col. 7 and so forth).

Regarding claim 28, The combination teaches determining an error between the channel impulse response position and a search window used to locate the channel impulse response and further configured to provide an adjustment in (see fig. 3 and pages 18-23 of WO).

Regarding claim 29, The combination teaches using a doppler rate in conjunction with window sliding/shifting.

Regarding claim 30, The combination teaches determining a maximum Doppler frequency for the received signal in (see Teder).

Regarding claims 36-38 and 51, the combination teaches being able to limit adjustment of signal via a window tracking unit and in light of the combination would limit any adjustment. The combination teaches the subject matter of claim 38 in (see figs. of WO, Popovic)

Regarding claim 39, WO teaches a radio base station in (see figs. and cols. 3-5 and disclosure) comprising:

one or more sectors having one or more antennas receiving a multipath signal with corresponding delays and a multi-path search processor comprising of a path selector, a channel estimator, a search window control unit, window tracking unit and demodulator. The searcher processor (60) is connected to the demodulator 954)

WO fails to teach a rake unit which can use a Doppler effect as part of processing signals.

Sengupta teaches a communication system wherein a rake receiver can include a plurality of elements including a searcher, fingers, a delay profile and a doppler generator in (see fig. 5) in order to improve signal quality and reduce interference.

Teder et al. teaches a communication system in (see fig. 1) wherein the rake unit including the demodulators can take into account a doppler effect when processing signals in (see cols. 4-7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of either Sengupta or Teder

into that of WO thus making it possible to demodulate signals taken into account a doppler effect in order to increase system performance and signal quality.

Regarding claims 40-41, the combination renders obvious the ability to determine doppler frequency based on fixed parameters such as Teder in (see col. 6 line 65-col. 7 of Teder) or based on measured parameters as received in (see col. 6 line 54-col. 7 of Sengupta).

Regarding claim s 42-44, The combination including WO teaches the claimed subject matter in (see figs. and disclosure).

Claims 15-22, 29-35 and 45-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/57819 (Popovic et al.) in view of Teder et al. (US Pat# 5,544,156) or Sengupta and further in view of Ellis et al. (US Pat# 3,394,313).

Regarding claims 15-22, 29-35 and 45-50, The combination teaches being able to enhance signal in part based on factors including a doppler effect frequency (maximum frequency) but fails to teach that a doppler means which uses a minimum dwell time for shifting.

Ellis teaches a communication system which incorporates a Doppler frequency means which can use a shifting rate expressed as a minimum dwell time in (see col. 2 lines 34-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the invention was to incorporate the teaching of Ellis into that of the combination thus

making it possible to use any conventional known method of detecting or implementing Doppler effect in order to enhance signal quality or reduce interference.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **REXFORD N BARNIE** whose telephone number is 571-272-7492. The examiner can normally be reached on M-F 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CURTIS KUNTZ can be reached on 571-272-7499. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PRIMARY EXAMINER
REXFORD BARNIE
06/30/05.

REXFORD BARNIE
PRIMARY EXAMINER